

Employment from the BLS household and payroll surveys: summary of recent trends

Overview

The Bureau of Labor Statistics (BLS) has two monthly surveys that measure employment levels and trends: the Current Population Survey (CPS), also known as the household survey, and the Current Employment Statistics (CES) survey, also known as the payroll or establishment survey.

Estimates from both surveys are published in the “Employment Situation” news release each month. The household and payroll surveys use different definitions of employment and distinct survey and estimation methods. To help data users better understand the differences in the surveys’ employment measures and divergences that sometimes occur in their trends, the following information is provided.

- **Summary comparison of household and payroll survey concepts, definitions, and methodologies**
- **Employment trends as measured by the payroll and household surveys**
- **Possible causes of differences in employment trends**
- **Summary of recent changes made to each survey:**
 - **Population control adjustments to the household survey**
 - **Benchmark revisions to the payroll survey**

Summary comparison of household and payroll survey concepts, definitions, and methodologies

Major features and distinctions of the two surveys are compared below in Box 1.

Box 1. How the household and payroll surveys compare

Comparison by:	Household Survey (CPS)	Payroll Survey (CES)
Universe	Civilian noninstitutional population age 16 and over	Nonfarm wage and salary jobs
Type of survey	Monthly sample survey of approximately 60,000 households	Monthly sample survey of about 160,000 businesses and government agencies covering approximately 400,000 establishments
Major outputs	Labor force, employment, unemployment, and associated rates with significant demographic detail	Employment, hours, and earnings with significant industry and geographic detail
Reference period	Calendar week that includes the 12 th of the month	Employer pay period that includes the 12 th of the month (could be weekly, biweekly, monthly or other)
Employment concept	Estimate of employed persons (multiple jobholders are counted only once)	Estimate of jobs (multiple jobholders counted for each nonfarm payroll job)
Employment definition differences	Includes the unincorporated self employed, unpaid family workers, agriculture and related workers, private household workers, and workers absent without pay	Excludes all of the groups listed at left, except for the logging component of agriculture and related industries

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Comparison by:	Household Survey (CPS)	Payroll Survey (CES)
Size of over-the-month change in employment required for a statistically significant movement	$\pm 436,000^1$	$\pm 99,000$
Benchmark adjustments to survey results	No direct benchmark for employment. Adjustments to underlying population base revised annually to intercensal estimates, and every 10 years to the decennial census	Employment benchmarked annually to employment counts derived primarily from Unemployment Insurance (UI) tax records

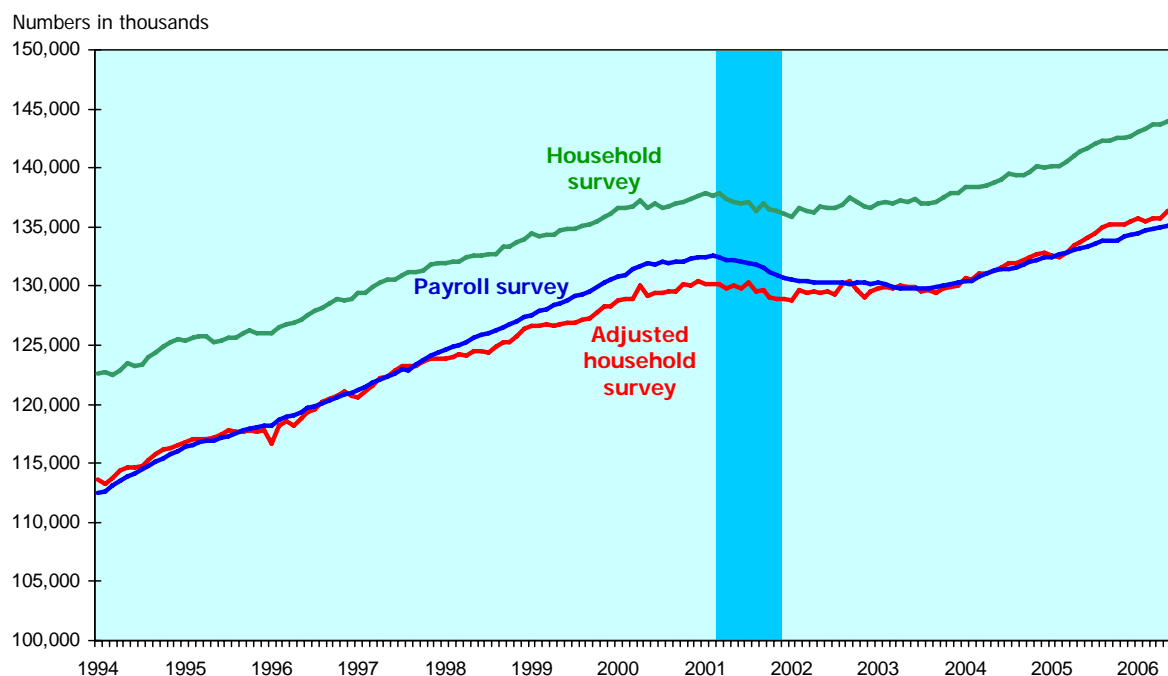
¹ This figure is updated periodically to incorporate more current data. The latest update (in March 2005) also included a correction in the program used to calculate it. For more information, see “Updates and adjustments to Current Population Survey standard errors” at http://www.bls.gov/cps/cps_err_update.htm.

Employment trends as measured by the household and payroll surveys

Chart 1 shows employment from the household and payroll surveys from January 1994 through the most recent month. Two variations of household survey employment used in BLS research are presented (these variations differ from the official series that appears in the “Employment Situation” and in the public database available through the BLS website). The green household survey line represents a version of total household survey employment where the effects of population control revisions in January 2000 and January of 2003-06 have been smoothed. The red “adjusted” household survey line represents the smoothed household survey employment series that has been further modified to make it more similar in concept and definition to payroll survey employment. This adjustment to household survey employment subtracts from total employment agriculture and related employment, nonagricultural self employed, unpaid family and private household workers, and workers absent without pay from their jobs, and then adds nonagricultural wage and salary multiple jobholders.

Chart 1 shows that, because of its broader employment definition, the household survey employment level (green line) normally exceeds that of the payroll survey. When the household survey is adjusted to more closely match the payroll survey definition (red line), trend discrepancies between the two surveys are more discernible. In particular, there is an obvious multi-year period from the late 1990s until the onset of the 2001 recession when payroll employment was growing significantly faster than household survey employment.

Chart 1. Household and payroll survey employment, seasonally adjusted, 1994-2006



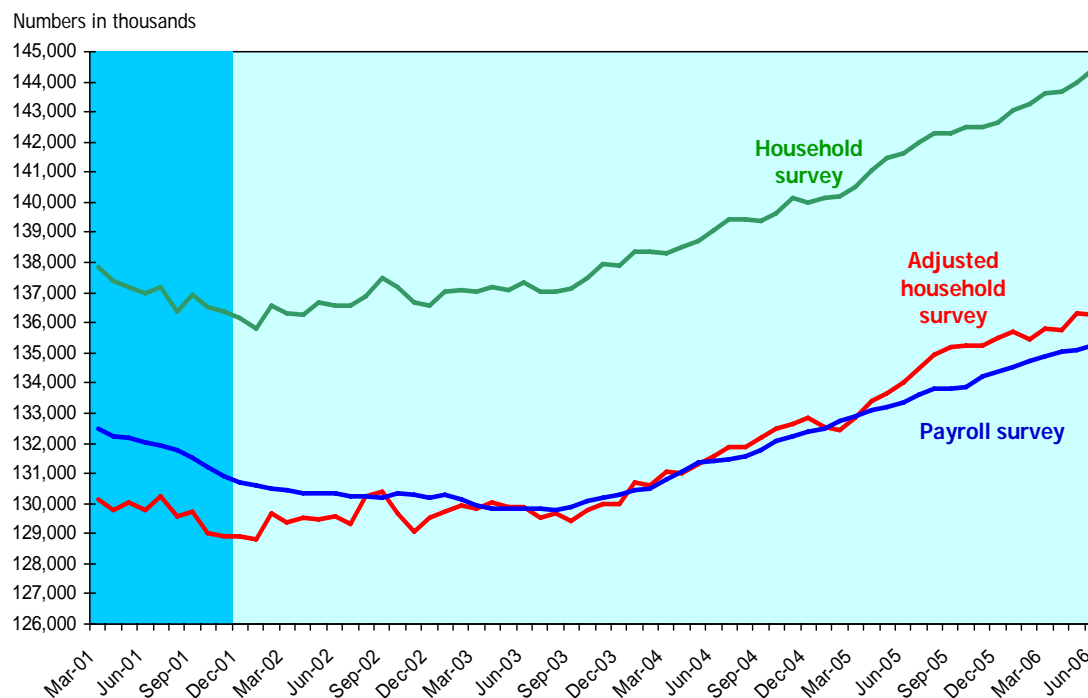
NOTE: The household series presented here has been smoothed for population control revisions. The "adjusted" household series has been adjusted to an employment concept more similar to the payroll survey and smoothed for population control revisions. Shaded area indicates recession.

SOURCE: Bureau of Labor Statistics, July 7, 2006.

Chart 2 shows the same payroll and household employment series as chart 1, but highlights only the 2001 recession and post-recessionary period from March 2001 through the most recent month. The Business Cycle Dating Committee of the National Bureau of Economic Research (NBER) designated March 2001 as the most recent business cycle peak and November 2001 as the most recent trough. (The NBER is a private, nonprofit, nonpartisan research organization that is the generally acknowledged arbiter of business cycle dating.)

From chart 2, more recent trends in employment from the two surveys can be seen. Payroll employment declined for a number of months following the end of the recession, while household survey employment trended up. Since fall 2003, employment as measured by both surveys has trended upward.

Chart 2. Household and payroll survey employment, seasonally adjusted, March 2001-June 2006



NOTE: The household series presented here has been smoothed for population control revisions. The "adjusted" household series has been adjusted to an employment concept more similar to the payroll survey and smoothed for population control revisions. Shaded area indicates recession.

SOURCE: Bureau of Labor Statistics, July 7, 2006.

Box 2 shows the change in employment levels from the payroll and household surveys as measured across the following time periods: 1) over the most recent month, 2) over the most recent year, 3) since March 2001, the most recent business cycle peak, and 4) since November 2001, the most recent business cycle trough. The peak and trough dates are determined by the National Bureau of Economic Research (NBER).

Box 2. Recent trends in payroll and household survey employment

Numbers in thousands

	Over-the-month change: May 2006- June 2006	Over-the-year change: June 2005- June 2006	From March 2001 (peak)- June 2006	From November 2001 (trough)- June 2006
Payroll survey: total nonfarm employment, seasonally adjusted ¹	121	1,854	2,726	4,347
Household survey: total employment, smoothed for population control revisions and seasonally adjusted	387	2,725	6,502	8,007
Difference	266	871	3,776	3,660

¹ Payroll employment for June 2006 is preliminary and subject to revision.

NOTE: The household survey figures in Box 2 are calculated from a variation of household survey employment used in BLS research (also shown by the green lines in Charts 1 and 2). This version of household survey employment smoothes out the effects of population control revisions to the survey in January of 2003-06.

Box 3 shows employment trends in the payroll and household surveys over the same periods as in Box 2, but this illustration uses adjusted household employment that is more comparable to the payroll survey (also shown in Charts 1 and 2). Even with this adjustment, the difference in employment change as measured by the two surveys since March or November of 2001 is significant.

Box 3. Recent trends in payroll employment and household survey employment adjusted to an employment concept more similar to that of the payroll survey

Numbers in thousands

	Over-the-month change: May 2006- June 2006	Over-the-year change: June 2005- June 2006	From March 2001 (peak)- June 2006	From November 2001 (trough)- June 2006
Payroll survey: total nonfarm employment, seasonally adjusted ¹	121	1,854	2,726	4,347
Household survey: total employment, smoothed for population control revisions, adjusted to be more like the payroll survey, and seasonally adjusted	-92	2,207	6,090	7,363
Difference	213	353	3,364	3,016

¹ Payroll employment for June 2006 is preliminary and subject to revision.

NOTE: The household survey figures in Box 3 are calculated from a variation of household employment used in BLS research (also shown by the red lines in Charts 1 and 2). This version of household employment adjusts household survey employment to make it more similar in concept and definition to payroll employment. This adjustment to household survey employment subtracts from total employment agriculture and related employment, nonagricultural self employed, unpaid family and private household workers, and workers on unpaid leave from their jobs, and then adds nonagricultural wage and salary multiple jobholders. It also smoothes out the effects of population control revisions to the survey in January of 2003-06.

Possible causes of differences in employment trends

The following summarizes some issues with the surveys that are important when comparing changes in employment from the two sources.

Sampling error – The payroll survey has a much larger sample size than the household survey. The payroll survey’s active sample covers approximately 400,000 business establishments *of all sizes* representing about one-third of total nonfarm employment. The household survey is much smaller at 60,000 households, covering a very small fraction of total employed persons. Household survey employment is therefore subject to larger sampling error, about 4 times that of the payroll survey on a monthly basis (see Box 1). When looking at short-term trends in either survey, especially over-the-month changes, it is essential to assess the statistical significance of the change. When comparing the two series over longer periods of time, however, other factors also need to be considered; some of these are discussed below.

Payroll survey benchmark – The payroll survey estimates are benchmarked once a year against a full universe count of employment derived from Unemployment Insurance (UI) tax records that nearly all employers are required to file. The payroll survey’s last benchmark—to March 2005 employment records—resulted in a small downward revision of 158,000 (119,000 on a seasonally adjusted basis), or one-tenth of one percent of total nonfarm employment. The historical average for benchmark revisions over the past decade has been plus or minus two-tenths of one percent. Hence, payroll employment continues to track closely with the universe of nonfarm payroll employment.

With regard to the benchmark source data, BLS has reviewed information from publicly available UI management reports concerning the timeliness of new business enrollments into the UI system. The findings are available in the report “Assessing the Timeliness of Business Births in BLS Establishment Statistics” on the BLS Internet site at <http://www.bls.gov/cew/eta581study.pdf>.

New business births in the payroll survey – The payroll survey sample does not include new firms immediately. They are incorporated with a lag. In the interim, a model-based estimate is used each month to account for employment resulting from new firm births. Based on the relatively small benchmark revision for March 2005, the model appears to be performing well during the recent period. Additional information about the birth/death model used in the payroll survey estimates is on the BLS Internet site at <http://www.bls.gov/web/cesbd.htm>.

Job changing - Employment estimates from the payroll survey are a count of jobs, unlike the household survey which provides a count of employed persons. If a person changes jobs within a payroll survey reference period, which is defined as the pay period including the 12th of the month, both jobs will be counted by the payroll survey estimates. If the rate of job-to-job movement changes substantially over time, it could impact trends produced from the payroll survey. While there is no method to directly measure effects from job changing, BLS is researching this issue using job change rates from the household survey. The initial findings of this research are provided in the report “Effects of Job Changing on Payroll Survey Employment Trends” at <http://www.bls.gov/ces/cesjobch.pdf>.

Population controls in the household survey – Population controls determine the weights used in the household survey to adjust the sample results to the overall level of the U.S. population. The population controls are developed by the U.S. Census Bureau. They are derived from decennial census information and, between census years, from administrative and other data. There are limitations to the population control estimates due primarily to the difficulties associated with estimating the net international migration component. The population controls contributed significantly to the discrepancy between payroll and household survey employment in the 1980s and 1990s when the household survey showed less growth than the payroll survey.

Worker classification in the household survey – As was illustrated in Box 3 above, adjusting for the measurable differences in the surveys' employment definitions resolves only a portion of the discrepancy. This adjustment process is imperfect, however, because precise data are not available in many cases to make the best possible adjustment. For example, some independent contractors are not reported as self employed in the household survey, but rather as wage and salary workers. This type of reporting issue limits BLS' ability to fully reconcile the two employment measures.

“Off-the-books” employment – Workers who are paid “off-the-books” are not reported in the payroll survey. The household survey could possibly include some of these workers, but BLS cannot determine the extent to which they might be reflected in household survey employment.

Summary

- BLS has estimated the measurable definitional differences between the household and payroll surveys and found they provide a partial explanation for the employment trend differences. There are a number of definitional differences between the surveys that cannot be readily measured or quantified. These differences may contribute to divergences in the surveys' trends, but their effects are either unknown or can only be conjectured. In addition, although BLS has devoted considerable attention to this issue, there may be other contributing factors that have not been identified.
- A summary of some of BLS' research was presented to the Federal Economic Statistics Advisory Committee (FESAC) in October 2003. The paper is available on the BLS Internet site at <http://www.bls.gov/bls/fesacp2101703.pdf>. In 2005, a FESAC subcommittee carried out its own review of the two surveys' employment measures at BLS' request. The FESAC report to BLS is available on the BLS Internet site at <http://www.bls.gov/bls/fesacp2120905.pdf>. An article was published in the February 2006 *Monthly Labor Review* that discusses BLS research and findings on the divergence between the two surveys. The article is available on the BLS website at <http://www.bls.gov/opub/mlr/2006/02/art2full.pdf>.
- BLS is continuing to investigate possible causes of recent divergences in employment growth between the payroll and household surveys. BLS also has implemented improvements that addressed past limitations. The redesign of the payroll survey, for example, led to the use of a probability sample, more frequent updating of the survey sample frame, and the development of a more effective means to estimate business births and deaths. With regard to the household survey population controls, the Census Bureau remains engaged in efforts to improve the intercensal population estimates. In particular, they have begun utilizing information from the large American Community Survey (ACS) to improve the estimates of net international migration.

- Both the payroll and household surveys are needed for a complete picture of the labor market. The payroll survey provides a highly reliable gauge of monthly change in nonfarm wage and salary employment. The survey has a large probability sample, and is benchmarked annually to a universe count of jobs derived from the unemployment insurance tax system. The payroll survey offers industry and geographic information at very detailed levels. The household survey provides a broader picture of employment including agriculture and the self employed, as well as detailed information on the demographic composition of the employed and the unemployed.

Population control adjustments to the household survey

January 2006 adjustment – As part of its annual review of intercensal population estimates, the U.S. Census Bureau determined that a small downward adjustment should be made to the household survey population controls. This adjustment stemmed from revised estimates of net international migration for 2000 through 2005 and updated information on births and deaths. In keeping with usual practice, the new controls were used in the survey starting with data for January 2006. Estimates for December 2005 and earlier months were *not* revised to reflect the new population controls.

A comparison of December 2005 data based on the old and new controls indicated that the revision to the population controls had a relatively small effect on the estimates of the labor force (-130,000), employment (-123,000), and unemployment (-8,000). The total unemployment rate, labor force participation rate, and employment-population ratio were not affected. Additional details on the January 2006 population adjustments are provided in the table below.

January 2006 household survey population control adjustment effect

Employment status of the population, December 2005, not seasonally adjusted

(Numbers in thousands)

	December 2005 based on adjusted population controls	Difference ¹	
	December 2005 as published		
Civilian noninstitutional population	227,425	227,358	-67
Civilian labor force	149,874	149,744	-130
Participation rate	65.9	65.9	.0
Employed	142,918	142,795	-123
Employment-population ratio	62.8	62.8	.0
Unemployed	6,956	6,949	-8
Unemployment rate	4.6	4.6	.0
Not in labor force	77,550	77,614	63

¹ Differences are calculated from unrounded estimates.

Previous population control adjustments—Following is a summary of recent adjustments to the household survey population controls.

With the release of January 2003 household survey data, BLS introduced two separate adjustments that increased the survey population controls.

- 1) Beginning in January 2000, household survey estimates reflect an increase in population resulting from the switch to the Census 2000 population controls.
- 2) In January 2003, household survey estimates reflect new, higher population controls. The upward adjustment resulted from higher estimates of net international migration in the population for 2000 through 2002.

With the release of January 2004 household survey data, BLS introduced adjustments that lowered the population controls. The downward adjustment resulted from lower estimates of net international migration in the population for 2000 through 2003.

These adjustments in population controls resulted in significant level shifts in the January employment estimates from the household survey in those years. The impact on employment of the January 2000 adjustment was an increase of approximately 1.6 million. The impact of the January 2003 adjustment was an increase of about 576,000. The January 2004 adjustment effect was a decrease of about 409,000.

In January 2005, BLS incorporated a very small downward adjustment to the population controls. This adjustment had relatively little impact on the household survey employment level (-45,000).

Interpreting household data with the population control adjustments – The level shifts in household survey employment resulting from these population adjustments make it difficult for data users to compare changes in employment over time periods that include these adjustments. As a convenience to its data users, BLS created a research series that smoothes out the level shifts in employment resulting from the January 2000 and January 2003-06 population control adjustments over a multi-year period rather than incorporating the entire changes in January of the years that they were implemented.

This household employment research series was used in Charts 1 and 2 and Box 2 above to provide a clearer picture for analysis. The full series, 1990-2005, is shown in the table below. Users should be aware that this research series will not match the official estimates in BLS publications and on the BLS website.

**Household Survey Employment Smoothed for Population Controls, Seasonally Adjusted,
January 1990-December 2005**

(In thousands)

	January	February	March	April	May	June	July	August	September	October	November	December
1990	119,093	119,082	119,238	118,898	119,209	119,052	118,891	118,894	118,628	118,651	118,432	118,379
1991	118,089	117,915	117,823	118,293	117,634	117,845	117,785	117,712	118,169	118,052	118,033	117,740
1992	118,265	118,050	118,454	118,748	118,709	118,764	119,071	119,195	119,101	119,020	119,280	119,413
1993	119,503	119,715	119,995	119,938	120,594	120,781	120,970	121,373	121,081	121,363	121,722	122,031
1994	122,547	122,679	122,534	122,908	123,497	123,277	123,362	124,013	124,372	124,811	125,230	125,448
1995	125,402	125,681	125,720	125,722	125,207	125,321	125,629	125,677	125,972	126,241	126,052	125,963
1996	126,013	126,542	126,779	126,924	127,189	127,562	127,922	128,161	128,540	128,909	128,801	128,904
1997	129,358	129,370	129,981	130,247	130,584	130,544	130,970	131,172	131,194	131,368	131,859	131,898
1998	131,958	132,053	132,072	132,484	132,614	132,545	132,643	132,718	133,333	133,359	133,655	133,994
1999	134,436	134,276	134,381	134,402	134,775	134,855	134,905	135,097	135,227	135,529	135,862	136,092
2000	136,564	136,608	136,717	137,291	136,656	136,971	136,567	136,703	136,940	137,140	137,379	137,676
2001	137,846	137,685	137,861	137,382	137,180	136,966	137,169	136,344	136,954	136,505	136,356	136,170
2002	135,826	136,576	136,333	136,279	136,695	136,569	136,569	136,859	137,475	137,176	136,697	136,584
2003	137,024	137,061	137,039	137,203	137,103	137,328	137,012	137,048	137,113	137,486	137,941	137,877
2004	138,355	138,375	138,330	138,534	138,716	139,051	139,458	139,423	139,357	139,628	140,133	139,988
2005	140,132	140,181	140,495	141,088	141,461	141,638	141,997	142,309	142,318	142,506	142,490	142,656

NOTE: This series reflects seasonally adjusted household survey employment that has been revised from January 1990-December 2005 to smooth out the effects of population control revisions introduced in January 2000 and January of 2003-06.

Source: Bureau of Labor Statistics, Division of Labor Force Statistics, February 3, 2006

Box 3 used a variation of the smoothed household survey employment research series that was adjusted to be more similar in concept and definition to payroll employment. That series, which begins in January 1994, is provided below.

**Household Survey Employment Smoothed for Population Controls and Adjusted to a Payroll Concept, Seasonally Adjusted
January 1994 - June 2006**

(In thousands)

	January	February	March	April	May	June	July	August	September	October	November	December
1994	113,684	113,268	113,797	114,366	114,603	114,661	114,826	115,260	115,800	116,101	116,345	116,565
1995	116,763	117,097	117,018	117,094	117,226	117,443	117,750	117,667	117,720	117,766	117,661	117,817
1996	116,727	118,208	118,582	118,144	118,873	119,334	119,547	120,141	120,435	120,760	121,146	120,716
1997	120,629	121,144	121,532	122,202	122,348	122,804	123,192	123,238	123,276	123,553	123,839	123,888
1998	123,888	124,044	124,253	124,055	124,499	124,470	124,362	124,848	125,252	125,292	125,820	126,380
1999	126,638	126,653	126,721	126,680	126,798	126,833	126,904	127,166	127,296	127,784	128,227	128,331
2000	128,828	128,929	128,943	130,056	129,203	129,369	129,479	129,500	129,590	130,117	130,075	130,475
2001	130,183	130,184	130,160	129,803	130,045	129,787	130,242	129,580	129,716	129,020	128,887	128,931
2002	128,798	129,687	129,376	129,546	129,449	129,555	129,342	130,218	130,380	129,672	129,054	129,514
2003	129,750	129,950	129,815	130,044	129,889	129,899	129,514	129,665	129,427	129,775	129,962	129,992
2004	130,697	130,587	131,033	131,015	131,305	131,548	131,895	131,892	132,179	132,492	132,660	132,859
2005	132,528	132,425	132,849	133,415	133,652	134,043	134,499	134,945	135,172	135,223	135,260	135,517
2006	135,719	135,474	135,785	135,736	136,342	136,250						

NOTE: This series represents not seasonally adjusted household survey employment that has been adjusted to an employment concept more similar to the payroll survey by subtracting from total employment agriculture and related employment, the self employed, unpaid family and private household workers, and workers on unpaid absences and then adding nonagricultural wage and salary multiple jobholders. The data were then revised to smooth out the effects of population control revisions introduced in January 2000 and January of 2003-06. The resulting employment series was then seasonally adjusted.

Source: Bureau of Labor Statistics, Division of Labor Force Statistics, July 7, 2006

Benchmark revisions to the payroll survey

Benchmark revisions are a standard part of the payroll survey estimation process. The benchmark adjustment represents a once-a-year re-anchoring of sample-based employment estimates to full employment counts available through unemployment insurance (UI) tax records filed by nearly all employers with State Employment Security Agencies.

The incorporation of March 2005 benchmarks published on February 3, 2006, led to a revision of all not seasonally adjusted data for the period subsequent to the last benchmark; that is, for April 2004 forward. At the same time, seasonally adjusted employment, hours, and earnings series were revised from January 2001 forward to incorporate updated seasonal adjustment factors.

March 2005 Benchmark Effects on the Nonfarm Payroll Series

The total nonfarm employment level for March 2005 was revised downward by 158,000 (119,000 on a seasonally adjusted basis) or one-tenth of one percent. Over the past 10 years, benchmark revisions have averaged two-tenths of one percent.

Following standard BLS methodology, estimates were recalculated for the year preceding and the months following the March 2005 benchmark reference month. The March 2005 UI-based benchmark level replaced the March 2005 sample-based employment estimate. The difference between the benchmark level and the estimate was wedged back to the previous benchmark level: 1/12 of the difference was added to the April 2004 employment level, 2/12 to May 2004 and so forth, through February 2005, which received 11/12 of the difference.

Estimates for April 2005 forward were recalculated by applying over-the-month changes from the sample to the new benchmark level, along with recomputed net birth/death factors, and new seasonal adjustment factors.

Revisions for November 2005 result from the effects of the benchmark process described above and the routine incorporation of additional sample receipts into the final estimates.

The net impact of the benchmarking process for January 2005 through November 2005 is shown in the table below.

Revisions in total nonfarm employment, seasonally adjusted, in thousands

	Employment levels as previously published	Employment levels as revised		Over-the-month changes as previously published	Over-the- month changes as revised	Difference
2005						
January	132,573	132,471		124	76	-48
February	132,873	132,736		300	265	-35
March	132,995	132,876		122	140	18
April	133,287	133,104		292	228	-64
May	133,413	133,210		126	106	-20
June	133,588	133,376		175	166	-9
July	133,865	133,617		277	241	-36
August	134,013	133,792		148	175	27
September	134,030	133,840		17	48	31
October	134,055	133,877		25	37	12
November	134,360	134,231		305	354	49